GENERAL GEOLOGY

The Seaverson Reservoir quadrangle, Carbon County, Wyo., was mapped as part of the U.S. Geological Survey's program of classifying and evaluating mineral lands in the public domain.

The quadrangle lies on the west flank of the Sierra Madre Range and on the eastern side of the Washakie basin. Several periods of deformation produced the Sierra Madre uplift and the Washakie structural basin. The Late Cretaceous and early Tertiary Laramide orogeny was the most important of these, tilting pre-Lance sedimentary units in a westward direction in the area of the quadrangle. Orogenic sediments were deposited and continued to be deformed during latest Cretaceous, Paleocene, and early Eocene time (McGookey and others, 1972; Robinson, 1972; Tweto, 1975).

The quadrangle is a semiarid upland of low relief, and altitudes range from 6,800 to 7,400 ft above mean sea level; vegetation is mostly sagebrush and grasses. Topographically, the area is characterized by low, rolling hills and north-northeast-trending ridges and strike valleys. Badland topography is developed locally on clay-rich strata of the Fort Union Formation. The Continental Divide crosses the southern part of the quadrangle. South of the divide drainage is into Muddy Creek which, in turn, flows into Little Snake River about 33 mi to the south at Baggs, Wyo. Drainage north of the Continental Divide is into Fillmore Creek, an intermittent stream near the northern edge of the quadrangle.

The Paleocene (Eocene(?) and Cretaceous(?)) Fort Union Formation is the only pre-Quaternary unit exposed in the quadrangle. The Fort Union has an estimated thickness of 4,000 ft, and consists mostly of claystone, mudstone, shale, siltstone, and poorly consolidated sandstone. Locally, however, sandstone forms hard, carbonate-cemented ledges as much as 3 ft thick. Coal and carbonaceous shale are generally restricted to two zones, one in the upper part of the lower half and the other near the top of the formation. The lowermost 500 ft of the Fort Union is composed of thick sandstone beds that are poorly consolidated, massive, crossbedded, and contain chert pebble stringers. According to pollen samples, these beds may be Cretaceous (R. D. Hettinger, written commun., 1977) and are below the lower coal zone and are not exposed in the quadrangle. C. S. V. Barclay (written commun., 1977) has evidence from an area south of the quadrangle that the uppermost beds of the Fort Union, as mapped, may be Eocene. Fossils collected (table 1) are not time diagnostic; ages are assigned on the basis of lithologic position.

The overlying Eccene Wasatch Formation is exposed in the High Point quadrangle to the west. The underlying Upper Cretaceous Lance Formation is exposed in the Fillmore Ranch quadrangle to the east.

Strata tilt to the northwest and surface dips range from 1° in the northwestern part of the quadrangle to 20° in the southeastern part. At depths below 500 ft, beds dip 1°-3° NW. No folding or faulting was recognized except in secs. 34 and 35, T. 18 N., R. 92 W., and secs. 2 and 3, T. 18 N., R. 92 W.

Within the Seaverson Reservoir quadrangle, the Fort Union Formation contains persistent coal beds as much as 49 ft thick in a 200-ft zone near the top of the formation and persistent coal beds as much as 28 ft thick in a 900-ft zone in the upper part of the lower half of the formation (see generalized coal section, sheet 2). In previous publications, letter designations for the coal beds were used by Sanders (1975), Glass (1972), Smith and others (1970), Berryhill and others (1950), and exploration crews. The following names, listed in ascending order with their former letter designations, are proposed for beds in the lower Fort Union coal zone: Red Rim (F), Olson Draw (E), Separation Creek (D), Muddy Creek (C), Fillmore Ranch (B), and Chicken Springs (A) coal beds. Proposed names and former letter designations for coal beds of the upper zone are, in ascending order: Horse Butte (E), Cow Butte (D), Lower Cherokee (C), Upper Cherokee (B), and High Point (A) coal beds. Thin, nonpersistent coal beds occur among these major beds and are designated as local beds (&), where they could be mapped. The Horse Butte coal bed was not recognized in outcrop or subsurface in the Seaverson Reservoir quadrangle, but it is an economic bed in the Creston Junction quadrangle, which lies immediately to the north (Sanders, 1975).

The upper and lower Cherokee beds, named for the Cherokee No. 1 and No. 2 mines in secs. 2 and 14, T. 19 N., R. 92 W., are separated by as much as 150 ft in the Creston Junction quadrangle (J. M. Back, written commun., 1976), but these coal beds come together to form a single bed in sec. 14, T. 19 N., R. 92 W. In general, the beds of the two Fort Union coal zones thin and become poorly defined to the northeast, through the Creston Junction and Riner quadrangles (J. M. Back, written commun., 1976; Sanders, 1974). The coals of the upper zone thin abruptly and pinch out to the southwest in the High Point quadrangle immediately west of the Seaverson Reservoir quadrangle. According to R. D. Hettinger (oral commun., 1976) the lower Fort Union coal zone is persistent south of the quadrangle, although it is not known if individual beds are continuous.

Averages of coal analyses are given in tables 2 and 3. These Fort Union coal beds range from lignite to subbituminous in rank, and average subbituminous C. Coal of the lower zone is of slightly higher rank and has a much lower sulfur content than coal of the upper zone.

Coal has not been mined in or near the quadrangle in significant quantity; however, this is an area of active coal exploration.

ACKNOWLEDGMENTS

The help of Pacific Power and Light Company, Rocky Mountain Energy Company, and Union Carbide Corporation in supplying information is gratefully acknowledged.

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SEAVERSON RESERVOIR QUADRANGLE DEPARTMENT OF THE INTERIOR WYOMING-CARBON CO. 7.5 MINUTE SERIES (TOPOGRAPHIC) Geology by G.M. Edson Massed years and Soblished by the Geological Survey assisted by G.S. Curtiss Control by USGS and USC&GS 1974 ROLD TELASSIFICATION Topography by photogrammetric methods from aerial photographs taken 1965. Field checked 1966 Polyconic projection. 1927 North American datum CONTOUR INTERVAL 20 FEET 10,000-foot grid based on Wyoming coordinate system DATUM IS MEAN SEA LEVEL east central zone WYOMING 1000-meter Universal Transverse Mercator grid ticks, zone 13, shown in blue UTM GRID AND 1966 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET. QUADRANGLE LOCATION SEAVERSON RESERVOIR, W

PRELIMINARY FOR CEOLOGICA TO MAP ACCURACY STANDARDS

SEAVERSON RESERVOIR QUADRANGLE, CARBON COUNTY, WYOMING

Gary M. Edson

copy within TEN days

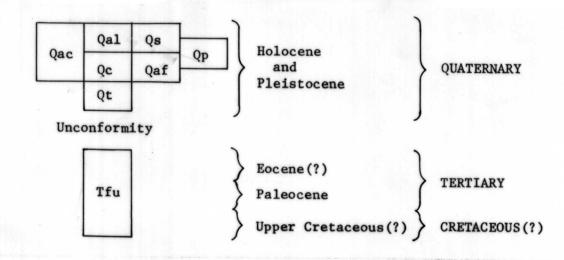
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OPEN-FILE REPORT 79-1577

SHEET 1 OF 2

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS ALLUVIUM -- Sand, silt, and minor gravel and clay in stratified deposits along major drainage WINDBLOWN SAND--Unstratified, well-sorted, fine sand

COLLUVIUM -- Sand, silt, and minor gravel in unstratified, unsorted deposits. Includes small slumps, landslides, and coalescing alluvial fans

ALLUVIUM AND COLLUVIUM--Of tributary valleys

Qs

Qc

Qac

Qaf

ALLUVIAL-FAN DEPOSITS--Unstratified, poorly sorted sand, silt, and minor gravel

PLAYA LAKE DEPOSITS -- Mainly stratified clay and silt in small depressions with central drainage TERRACE DEPOSITS -- Mainly poorly stratified fine sand and silt locally sparsely covered by gravel; bordering Fillmore Creek and as remnant islands in drainage. From 1 to 5 ft above modern alluvial surface

FORT UNION FORMATION -- Claystone, mudstone, shale, siltstone, sandstone, carbonaceous shale, and coal. The upper 500 ft and lower 1,900 ft (lower half of formation) contain coal, lignite to subbituminous C in rank. All except uppermost 50(?) ft and lowermost 500(?) ft are exposed in quadrangle. A carbonaceous shale sample, collected south of the quadrangle and 272 ft above the commonly mapped Fort Union-Lance contact, contained Late Cretaceous palynomorphs. Shown as TKfu on map. Total thickness about 4,000 ft

4.5+ / COAL BED--Mapped at base; dashed where approximately located; short dashed where inferred or indefinite; dotted where concealed; &, local, unnamed bed. Thickness of bed, in feet, measured at triangle; + indicates measurement of partly concealed coal bed whose total thickness is unknown

BAKED ROCKS--Mapped at base; formed by the burning of coal beds in place

CONTACT--Approximately located

FAULT--Approximately located; U, apparent upthrown side; D, apparent downthrown side; dashed where inferred

3 × ATTITUDE OF BEDS--Dashed where attitude inferred from structure contours

-6500- STRUCTURE CONTOUR--Drawn on base of Fillmore Ranch coal bed. Contour interval 100 ft. Short dashed where projected above land surface

-7/00- STRUCTURE CONTOUR--Drawn on base of upper Cherokee coal bed. Contour interval 50 ft (northwest corner only)

DRILL HOLE--Listed in table 4, sheet 2

FOSSIL LOCALITY--Listed in table 1

GRAVEL -- Thin (0-3(?) ft) concentrations capping hills and ridges and mantling some slopes; probably derived from older, higher gravel deposits or conglomerate-capped areas

Table 1. -- Fossil collections

[Nos. 1, 3, and 5 identified by J. H. Hanley; no. 2 by G. E. Lewis; no. 4 by J. A. Wolfe]

٥.	Location	Age	Fossils	USGS Denver catalog No.
	SWESWE sec. 16, T. 19 N., R. 91 W.	Paleocene	Unionidae: gen. and sp. indet. Champosaurus sp.	Not assigned Do.
	SW4SW4 sec. 14, T. 19 N., R. 92 W.	Paleocene(?)	Viviparidae: gen. and sp. indet. Viviparus cf. V. raynoldsanus (Meek and Hayden)	D1201NM
	SW4NW4 sec. 23, T. 19 N., R. 92 W.	do	Metasequoia sp.	Not assigned
	Do	do	Viviparus sp. indet. Lioplacodes limnaeformis (Meek and Hayden) L. tenuicarinata (Meek and Hayden)	D1202NM

Table 2. -- Thicknesses of coal beds and analyses of coal core samples

[Based on drill-hole data and analyses supplied by and published with the permission of Pacific Power and Light Co. Rocky Mountain Energy Co., and Union Carbide Corporation. ---, no data]

Coal bed		Thickness (feet)		No. of No. sample of	No.	Analysis (in percent) as received					Heat-	
								Vola-	Fixed	:	ing	Rank
		nge	Avg.	local- ities	anal- yses	Mois- ture	Ash	tile matter	bon	Sul- fur	value Btu/1b	
High Point	1.5- 8		5	1	1	15.87	20.36	34.76	29.01	3.33	7,782	Subbituminous
Upper and lower Cherokee	18	-49	35	10	65	21.47	14.91	34.63	28.99	2.12	8,003	Do.
Cow Butte	5	-10	8	4	4	22.27	18.46	35.06	24.21	3.57	7,393	Lignite
Chicken Springs-	2	- 5	3.5	2	2	24.40	7.10	30.62	38.79	1.99	8,673	Subbituminous
Fillmore Ranch	16	-28	22	7	7 '	25.25	5.77	29.07	40.41	.40	8,562	Do.
Muddy Creek	2	-10	7.5	3	3	23.66	5.83	29.61	40.89	.50	8,892	Do.
Separation Creek	3	-12	8	2	2	23.60	7.35	29.55	39.51	.46	8,738	Do.
Olson Draw	2.	5-11	5.5	-								-
Red Rim	6	-21	10.5	1	1	21.64	11.48	28.46	38.42	.45	8,384	Subbituminous

Table 3. -- Averaged analyses of air-drilled coal samples

[Samples are from holes drilled by the U.S. Geological Survey (Edson and Curtiss, 1976)]

	sample localities	Analysis (in percent) as received					neating	
Coal bed		Moisture	Ash	Volatile matter	Fixed carbon	Sulfur	value Btu/lb	Rank
Upper and lower Cherokee	2	20.4	28.5	26.0	25.2	3.31	5,649	Lignite
Fillmore Ranch	3	22.5	9.9	29.4	38.3	0.48	8,214	Subbituminous
Muddy Creek	1	20.5	11.3	30.0	38.2	1.39	8,199	Do.

To convert 0.3048 Meters Feet 1.609 Kilometers Miles

CONVERSION TABLE

This report has not been edited for conformity with U.S. Geological Survey editorial standards or stratigraphic nomenclature.